

WHAT IS CLAIMED IS:

1. A hybrid pipette comprising:

a pipette casing;

a slide shaft vertically movable in response to an operation of a pushbutton;

a plunger disposed below said slide shaft;

a spring for urging said plunger upwardly;

an engagement member coaxially and movably fitted on said slide shaft, said engagement member extending through a hole of said pipette casing so as to be movable at least vertically; and

an electric motor provided on an axis different from an axis of said slide shaft, said electric motor being operatively engaged with said engagement member;

wherein, in a manual operation mode, said slide shaft and plunger move vertically in response to the operation of said pushbutton to perform suction and discharge of a liquid; and

wherein, in a motor-driven operation mode, said engagement member is driven to move vertically by said electric motor, whereby said plunger is moved vertically to perform suction and discharge of a liquid.

2. A hybrid pipette according to claim 1, wherein said engagement member is a tubular threaded member having an external thread on an outer periphery thereof, and said hole in the member of said pipette casing is an internally threaded hole, said tubular threaded member being in thread engagement with said internally threaded hole, so that said

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tubular threaded member is driven to rotate by said electric motor, thereby moving vertically through thread engagement with said internally threaded hole.

3. A hybrid pipette according to claim 1, wherein said engagement member is a rack member having an axially extending rack on an outer periphery thereof, said rack member extending through said hole of said pipette casing, and said rack member being moved vertically by a pinion driven by said electric motor.

4. A hybrid pipette according to any one of claims 1 to 3, further comprising:

a transmission gear mechanism provided between said electric motor and said engagement member.

5. A hybrid pipette according to any one of claims 1 to 4, wherein said electric motor is a direct-current motor, said direct-current motor being provided with a brake mechanism.

6. A hybrid pipette according to any one of claims 1 to 4, wherein said electric motor (51) is a pulse motor.

7. A hybrid pipette according to any one of claims 1 to 6, further comprising:

a battery for driving said electric motor.

8. A hybrid pipette comprising:

a pipette casing;

a slide shaft vertically movable in response to an operation of a pushbutton;

a plunger disposed below said slide shaft;

a spring for urging said plunger upwardly;

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an electric motor provided in coaxial relation to said slide shaft, said electric motor having a central internally threaded hole; and

a tubular threaded member with an external thread on an outer periphery thereof, said tubular threaded member being coaxially and movably fitted on said slide shaft and vertically movably extending through the central internally threaded hole of said electric motor;

wherein, in a manual operation mode, said slide shaft and plunger move vertically in response to the operation of said pushbutton to perform suction and discharge of a liquid; and

wherein, in a motor-driven operation mode, said tubular threaded member is driven to move vertically by said electric motor, whereby said plunger is moved vertically to perform suction and discharge of a liquid.

9. A hybrid pipette according to claim 8, wherein said electric motor is a direct-current motor, said direct-current motor being provided with a brake mechanism.

10. A hybrid pipette according to claim 8, wherein said electric motor is a pulse motor.

11. A hybrid pipette according to any one of claims 8 to 10, further comprising:

a battery for driving said electric motor.

12. A hybrid pipette comprising:

a pipette casing;

a slide shaft vertically movable in response to an operation of a pushbutton;

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a plunger disposed below said slide shaft, said plunger being vertically movable together with said slide shaft as one unit;

an electric motor provided in coaxial relation to said slide shaft, said electric motor having an internally threaded hole;

a tubular threaded member with an external thread on an outer periphery thereof, said tubular threaded member being coaxially and movably fitted on said slide shaft and being thread-engaged with the internally threaded hole in said electric motor to allow said slide shaft to move vertically; and

at least one spring interposed between a predetermined position on said slide shaft and said tubular threaded member to urge said slide shaft and plunger upwardly so that a predetermined portion of said slide shaft or plunger abuts against a predetermined portion of said tubular threaded member or the pipette casing;

wherein, in a manual operation mode, said slide shaft and plunger move vertically in response to the operation of said pushbutton to perform suction and discharge of a liquid; and

wherein, in a motor-driven operation mode, said tubular threaded member is driven to move vertically by said electric motor, whereby said plunger is moved vertically to perform suction and discharge of a liquid.

13. A hybrid pipette according to claim 12, wherein said at least one spring is interposed between an upper end of

said tubular threaded member projecting above said electric motor and an upper portion of said slide shaft within said pipette casing.

14. A hybrid pipette according to claim 12 or 13, wherein said slide shaft and plunger are fabricated integrally as a single member.

15. A hybrid pipette according to claim 12 or 13, wherein said slide shaft and plunger are fabricated as separate members and joined together as one unit by screwing one of said slide shaft and plunger into the other of them or by using a pin.

16. A hybrid pipette according to any one of claims 11 to 15, wherein said electric motor is a direct-current motor, said direct-current motor being provided with a brake mechanism.

17. A hybrid pipette according to any one of claims 11 to 15, wherein said electric motor is a pulse motor.

18. A hybrid pipette according to any one of claims 11 to 17, further comprising:

a battery for driving said electric motor.

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